Claims

[c1] 1. A method for fixedly securing a plastic encapsulated transducer to a metal interface cup for attachment with a machine comprising:
configuring the metal interface cup substantially as a cylinder defined by a cylinder wall and a bottom wall closing a bottom of said cylinder, said cylinder including a first bore corresponding to an inner diameter defined by said cylinder wall, said first bore corresponding to an outside diameter of the plastic encapsulated transducer;
configuring a second bore extending through opposing sides defining an exterior of said cylinder wall and substantially transverse to said first bore;
configuring an undercut in said first bore intersecting said second bore, said undercut defining a circumferential groove in said cylinder wall;
injecting plastic into a cylindrical overmold surrounding the metal interface cup having the plastic encapsulated transducer disposed in said first bore, wherein injection of plastic flows in an axial length defining said overmold toward the metal interface cup and circumferentially into said undercut via said second bore, thus forming a solid interference therebetween upon solidification restricting

axial movement therebetween.

[c2] 2. The method of claim 1 further comprising:
configuring at least one void in said bottom wall, wherein injection of plastic flows in said axial length defining said overmold toward the metal interface cup and circumferentially into said undercut and into said at least one void via said second bore, thus forming a solid interference therebetween upon solidification restricting axial and torsional movement therebetween.

[c3] 3. The method of claim 1, wherein said at least one void includes a channel substantially parallel with said second bore.

[c4] 4. The method of claim 3 wherein said channel is formed upon said configuring said second bore substantially transverse to said first bore.

[c5] 5. The method of claim 4 wherein a U-shaped cutout is configured on opposing sides of the cup defined by said second bore, each said U-shaped cutout facilitating flow of molten plastic to said channel and said undercut.

[c6] 6. The method of claim 5, wherein each said U-shaped cutout configured on opposing sides of the cup correspond to a ferrule extending from the plastic encapsulated transducer.

[c7] 7. The method of claim 5, wherein said flow of molten plastic flows circumferentially into said undercut from said molten plastic flow into each opposing said U-shaped cutout.

[c8] 8. The method of claim 1 wherein the metal interface cup is a stainless steel cup.

[c9] 9. The method of claim 1 wherein said injecting plastic into a cylindrical overmold surrounding the metal interface cup having the plastic encapsulated transducer disposed in said first bore is a secondary injection molding process providing a durable encapsulation bonding the plastic encapsulated transducer with the metal interface cup, said plastic encapsulated transducer including a coil perpendicularly disposed to a cable assembly extending therefrom.

[c10] 10. The method of claim 1, wherein said undercut extends radially outwardly into said cylinder wall about 0.015 inch and includes a width of about 0.035 to about 0.040 inch.

[c11] 11. An apparatus for fixedly securing a plastic encapsulated transducer to a metal interface cup for attachment with a machine comprising:
a metal interface cup configured substantially as a cylin-

der defined by a cylinder wall and a bottom wall closing a bottom of said cylinder, said cylinder including a first bore corresponding to an inner diameter defined by said cylinder wall, said first bore corresponding to an outside diameter of the plastic encapsulated transducer;
a second bore extending through opposing sides defining an exterior of said cylinder wall and substantially transverse to said first bore;
an undercut configured in said first bore intersecting said second bore, said undercut defining a circumferential groove in said cylinder wall;
a cylindrical overmold surrounding the metal interface cup having the plastic encapsulated transducer disposed in said first bore, wherein injection of plastic flows in an axial length defining said overmold toward the metal interface cup and circumferentially into said undercut via said second bore, thus forming a solid interference therebetween upon solidification restricting axial movement therebetween.

[c12] 12. The apparatus of claim 11 further comprising:
at least one void configured in said bottom wall, wherein injection of plastic flows in said axial length defining said overmold toward the metal interface cup and circumferentially into said undercut and into said at least one void via said second bore, thus forming a solid in-

terference therebetween upon solidification restricting axial and torsional movement therebetween.

[c13] 13. The apparatus of claim 11, wherein said at least one void includes a channel substantially parallel with said second bore.

[c14] 14. The apparatus of claim 13 wherein said channel is formed when said second bore is configured substantially transverse to said first bore.

[c15] 15. The apparatus of claim 14 wherein a U-shaped cutout is configured on opposing sides of the cup defined by said second bore, each opposing said U-shaped cutout facilitating flow of molten plastic to said channel and said undercut.

[c16] 16. The apparatus of claim 15, wherein each said U-shaped cutout configured on opposing sides of the cup corresponds to a ferrule extending from the plastic encapsulated transducer.

[c17] 17. The apparatus of claim 15, wherein said flow of molten plastic flows circumferentially into said undercut from said molten plastic flow into each opposing said U-shaped cutout.

[c18] 18. The apparatus of claim 11 wherein said metal inter-

face cup is a stainless steel cup.

[c19] 19. The apparatus of claim 1 wherein said injection of plastic into said cylindrical overmold surrounding said metal interface cup having the plastic encapsulated transducer disposed in said first bore is a secondary injection molding process providing a durable encapsulation bonding said plastic encapsulated transducer with said metal interface cup, said plastic encapsulated transducer including a coil perpendicularly disposed to a cable assembly extending therefrom.

[c20] 20. The apparatus of claim 1, wherein said undercut extends radially outwardly into said cylinder wall about 0.015 inch and includes a width of about 0.035 to about 0.040 inch.